

three groups, participants used one of three scales. Five films, randomly selected, were shown twice for intraobserver reliability. Speed, ease of use and face validity of the scales were evaluated. Response rate was excellent; 89% of the EAAPS (16/18), 100% of the M&S (18/18) and NRS groups (10/10). The intraclass correlation (ICC) of 0.87 for EAAPS indicates significantly better inter-observer reliability compared to 0.68 [95% confidence interval (CI): 0.58–0.79] for M&S and 0.71 for NRS. A kappa of 0.95 for the intraobserver reliability of EAAPS compared to 0.77 (95%CI: 0.68–0.86) for the other scales. Convergent, extreme group and predictive validities were comparable for all three scales. Regarding the usability of the scales, there was no significant difference between the three scales with respect to the time taken to score the films (speed) or the ease of use of the scales. The face validity, however, was significantly better for the M&S scale compared to the EAAPS scale. The EAAPS showed superior reliability, the M&S scale, better face validity with comparable usability and other tests of validity.

**A PLACEBO CONTROLLED CLINICAL TRIAL ON CETIRIZINE IN SEASONAL HEADSHAKERS.** A.J. van den Brom-Spiereburg<sup>1</sup>, S.J. Mesu<sup>2</sup>, C.M. Westermann<sup>1</sup>. <sup>1</sup>Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands, <sup>2</sup>Pharmacy, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands

Trigeminal mediated headshaking is a syndrome that may have several causes and is a potential threat to the wellbeing of the horse. Because one of the possible etiologies is an allergic rhinitis, a randomized double-blinded placebo controlled clinical trial on the effectiveness of cetirizine, an antihistamine, in 30 seasonal headshakers was performed. A lunge protocol of 9 min, consisting of rest, walk and trot, was recorded at the start, after a week of treatment with cetirizine and after a week of placebo. Weather conditions were also recorded and owners kept a diary.

The videos were scored for the amount of shakes. The overall amount of shakes was  $67 \pm 94$  at the start and  $47 \pm 72$  on cetirizine. This difference was significant ( $P = 0.01$ ). Placebo compared to start was not significantly different ( $P = 0.18$ ) as was cetirizine vs placebo ( $P = 0.74$ ). Evaluating results of individual horses 10 horses showed >50% improvement on cetirizine and 11 horses showed a >50% improvement on placebo (compared to  $t = 0$ ). Factors like weather circumstances will be taken into account.

This study shows the difficulty of using a clinical trial for a syndrome influenced by weather and many other factors. It does suggest however that even if cetirizine will not be beneficial in all (seasonal) headshaking horses, it may be in some, both diagnostic for proving an allergic etiology, as well as therapeutic which is also suggested by follow-up of these horses and other clinical cases.

**INSULINAEMIC AND GLYCAEMIC RESPONSES TO THREE FORAGES IN PONIES.** H.B. Carlslake<sup>1</sup>, C. McG. Argo<sup>1</sup>, G.L. Pinchbeck<sup>2</sup>, A.H.A. Dugdale<sup>1</sup>, C.M. McGowan<sup>1</sup>. <sup>1</sup>Institute of Aging and Chronic Disease, University of Liverpool, Leahurst, Cheshire, UK, <sup>2</sup>Institute of Infection and Global Health, Faculty of Health and Life Sciences, University of Liverpool, Leahurst, Cheshire, UK

Reduction of the hyperinsulinaemic response to feeding is central to the management of equine metabolic syndrome (EMS). The aim of this study was to compare insulinaemic and glycaemic responses to three commonly fed forages. Twelve ponies (11 mares and 1 gelding) of mixed breeds, mean age 9 years old (range 4–15) and median body condition score 7.0/9 (range 4.2–7.8) were recruited and maintained under identical management conditions. Following acclimation, a randomised crossover study was conducted. Each week ponies were fed 0.25% body weight as dry matter (DM) either as hay, soaked hay or haylage, or a combined glucose-insulin tolerance test (CGIT) was conducted. The glycaemic and insulinaemic responses to feeding were monitored over 5 h. Area under the curve (AUC) for insulin (AUCi) was greater for haylage compared to hay ( $P = 0.019$ ) and soaked hay ( $P = 0.002$ ), and greater for hay compared to soaked hay ( $P = 0.002$ ). AUC for glucose (AUCg) was lower for soaked hay

compared to hay ( $P = 0.002$ ) and haylage ( $P = 0.003$ ). Four ponies were classified as EMS positive based on their CGIT result. Compared to EMS negative ponies, EMS positive ponies had greater AUCi after hay ( $P = 0.027$ ), soaked hay ( $P = 0.017$ ) and haylage ( $P = 0.042$ ). In contrast, there was no detectable effect of EMS status on AUCg. On an equivalent DM basis, soaked hay produced the lowest and haylage the highest insulinaemic and glycaemic responses to feeding. The insulinaemic effects of all forages were greater in ponies with EMS. These data can be used to guide feeding of equids with EMS.

**HYPOGLYCIN-A TOXIN AND ATYPICAL MYOPATHY: WHICH MAPLE TREES ARE A RISK?.** C.M. Westermann<sup>1</sup>, R. van Leeuwen<sup>2</sup>, H.G.J. Mol<sup>2</sup>. <sup>1</sup>Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, The Netherlands, <sup>2</sup>RIKILT-Wageningen UR, Wageningen, The Netherlands

The Acer (maple) genus of trees comprises over 120 species worldwide. Some of these contain the plant-toxin hypoglycin-A which has been proven to be a cause of the highly fatal condition called atypical myopathy (AM) in horses and ponies. In an earlier study of maple-tree samples (leaves and seeds) collected by owners of healthy and AM-affected horses it was shown that the seeds contain significantly more toxin than the leaves. There is a concern as to whether maple trees can be safely retained or planted around paddocks or pastures, and whether there is a difference in toxicity between different species.

The aim of the present study was to investigate the amount of toxin in different maple-tree species present in The Netherlands.

The seeds of 20 different tree-species of the 'Acer' genus, present in the arboretum in Wageningen, The Netherlands, were analysed for hypoglycin-A; 8 species belonged to the 'Platanoidea' subgenus (section), 7 to the 'Acer', 3 to the 'Palmata' and 2 to the 'Negundo' subgenera. Assay was carried out using a newly validated method based on liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS).

Seeds of the maple trees belonging to the 'Platanoidea' contained no hypoglycin-A. The seeds of species belonging to the 'Acer', 'Palmata' and 'Negundo' subgenera however contained 96–1744 mg/kg, 4–32 mg/kg and 3–444 mg/kg of the toxin respectively.

These results indicate that the precise tree species is an important aspect when giving advice regarding the toxicity of maple trees and the consequent risk for horses.

**ULTRASONOGRAPHIC MEASUREMENTS OF LOCALIZED FAT ACCUMULATION IN NORMAL AND HIGH ENERGY FED SHETLAND PONY MARES OVER TIME.** E.W. Siegers, M. de Ruijter-Villani, E. Roelfsema. Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, The Netherlands

Health hazards of obesity are more closely related to the localization of the fat excess, rather than elevated body weight per se. In this study effects of a diet-induced increase in body weight on body fat accumulation and localization was determined in 13 Shetland pony mares (3–7 years old), randomly divided into a control and a test group. They were fed either a maintenance diet (100% NE) or high fat diet (200% NE) for 24 weeks. BCS were not significantly different at the start of the diet ( $4.9 \pm 1.2$  vs.  $5.1 \pm 1.2$ ) between both groups. Twelve weeks after starting the diet, measurements of the BCS, body weight and ultrasonography of adipose tissue on five different locations (retroperitoneal, axillary, withers, ribeye and rump) started on a monthly basis. Linear mixed-effects model with Bonferroni as post hoc test was used for statistics.  $P$  values <0.05 were considered significant. Fat thickness in the test group was already significantly higher compared to the control group at week 12. During the measuring period, the test group showed a further significant increase in mean body weight (+20%,  $P < 0.05$ ) and BCS ( $8.3 \pm 0.3$ , +61%) while the control group remained the same. The test group kept increasing retroperitoneal fat accumulation significantly over time, while adipose tissue stored in axilla, withers, ribeye and rump region ceased to increase after three months of measurements. In conclusion diet induced fat accumulation initially occurred both subcutaneously and retroperitoneally, while after 20 weeks further fat accumulation occurred mainly intra-abdominally.